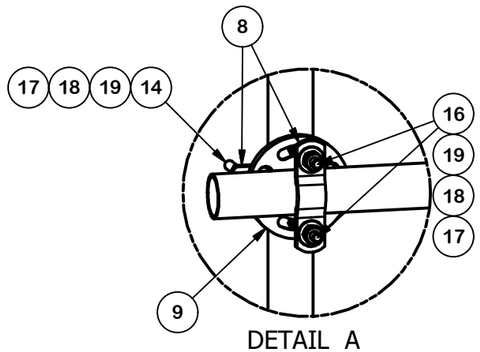
# APPENDIX - I

# ANTENNA MOUNT SHOP DRAWINGS

Appendix - I contains the following documents:

- Site Pro 1: PSA6, 6’ Side Arm Assembly
- Site Pro 1: PSA6 Engineering Letter dated June 5, 2020
- Site Pro 1: R5 Universal Pipe Mount Assembly
- Site Pro 1: R5 Engineering Letter dated June 5, 2020




DETAIL A





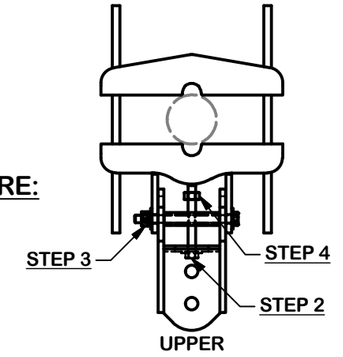


DETAIL B

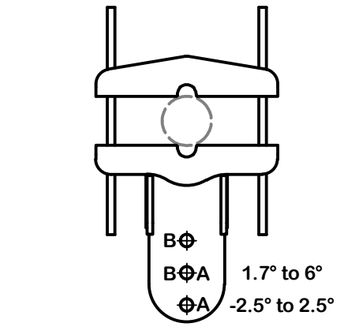
| PARTS LIST | | | | | | |
|---|---|---|---|---|---|---|
| ITEM | QTY | PART NO. | PART DESCRIPTION | LENGTH | UNIT WT. | NET WT. |
| 1 | 1 | X-195646 | 6' STANDOFF PIVOT ARM | | 67.36 | 67.36 |
| 2 | 1 | P2126 | 2-3/8" X 126" (2" SCH. 40) GALVANIZED PIPE | 126 in | 40.75 | 40.75 |
| 3 | 1 | X-SDTFLB | DIAGONAL SLOT WELDMENT FOR BCAM SD | | 15.08 | 15.08 |
| 4 | 1 | X-SDMHTP | MULTI-HOLE TAPER PLATE WELDMENT | | 16.63 | 16.63 |
| 5 | 1 | X-SDCAMSS | STRAIGHT SLOT WELDMENT FOR BCAM | | 8.48 | 8.48 |
| 6 | 2 | X-LCBP2 | BENT BACKING PLATE | 12 in | 8.86 | 17.73 |
| 7 | 1 | X-SDCAMSP | POSITIONING PLATE WELDMENT FOR BCAM | | 1.43 | 1.43 |
| 8 | 4 | X-100064 | CLAMP (4" V-CLAMP) GALVANIZED | | 0.92 | 3.69 |
| 9 | 2 | X-127594 | FLAT DISK CLAMP PLATE 4" CENTERS (GALV.) | | 2.51 | 5.01 |
| 10 | 2 | A34214 | 3/4"-10 X 2-1/4" A325 BOLT | 2 1/4 in | 0.47 | 0.95 |
| 11 | 2 | G34LW | 3/4" HDG LOCKWASHER | | 0.04 | 0.09 |
| 12 | 2 | G34NUT | 3/4" HDG HEAVY 2H HEX NUT | | 0.21 | 0.42 |
| 13 | 8 | G12R-15 | 1/2" x 15" THREADED ROD (HDG.) | | 0.84 | 6.69 |
| 14 | 6 | G12065 | 1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD | 5 1/2 in | 0.41 | 2.46 |
| 15 | 1 | G12045 | 1/2" x 4.5" HDG HEX BOLT GR5 FULL THREAD | 4 1/2 in | 0.30 | 0.30 |
| 16 | 4 | G1204 | 1/2" x 4" HDG HEX BOLT GR5 FULL THREAD | 4 in | 0.27 | 1.08 |
| 17 | 13 | G12FW | 1/2" HDG USS FLATWASHER | 3/32 in | 0.03 | 0.44 |
| 18 | 26 | G12LW | 1/2" HDG LOCKWASHER | 1/8 in | 0.01 | 0.36 |
| 19 | 27 | G12NUT | 1/2" HDG HEAVY 2H HEX NUT | | 0.07 | 1.93 |
| | | | | | TOTAL WT. # | 182.62 |

## ANGLE CALIBRATING PROCEDURE:

1. MEASURE TOWER TAPER AND PICK LOWER BRACKET HOLE:
   - HOLE A = -2.5° TO 2.5°
   - HOLE B = 1.7° TO 6°
2. USE CALIBRATING BOLT TO ADJUST FRAME TO DESIRED TAPER
3. TORQUE LOCKING BOLTS TO 75 ft.-lbs.
4. ADVANCE LOCKING NUT TO POSITIONING PLATE, THEN TIGHTEN.




UPPER




LOWER

| REV | DESCRIPTION OF REVISIONS | CPD | BY | DATE |
|---|---|---|---|---|
| C | UPDATE LEG CONNECTION | | CSL | 2/26/2020 |
| B | CHNAGED SIDEARM LEG CONNECTION | | CEK | 6/8/2017 |
| A | P1126 CHANGED TO P2126 | 4749 | CEK | 11/13/2015 |

REVISION HISTORY

## TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

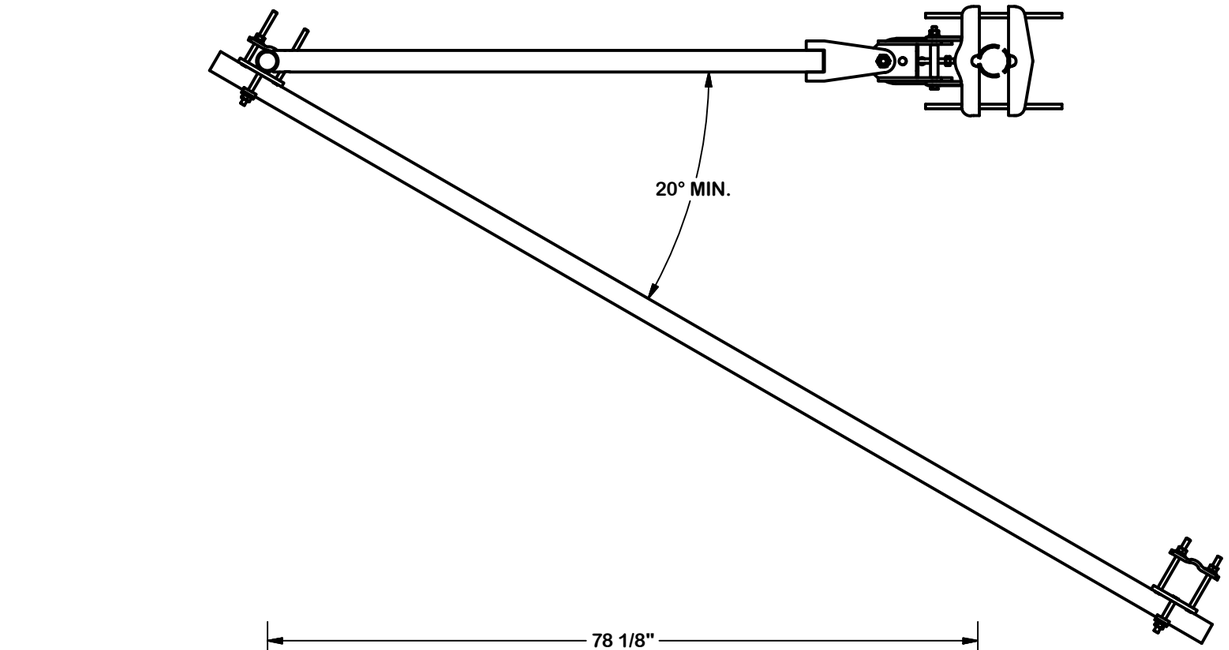
PROPRIETARY NOTE:
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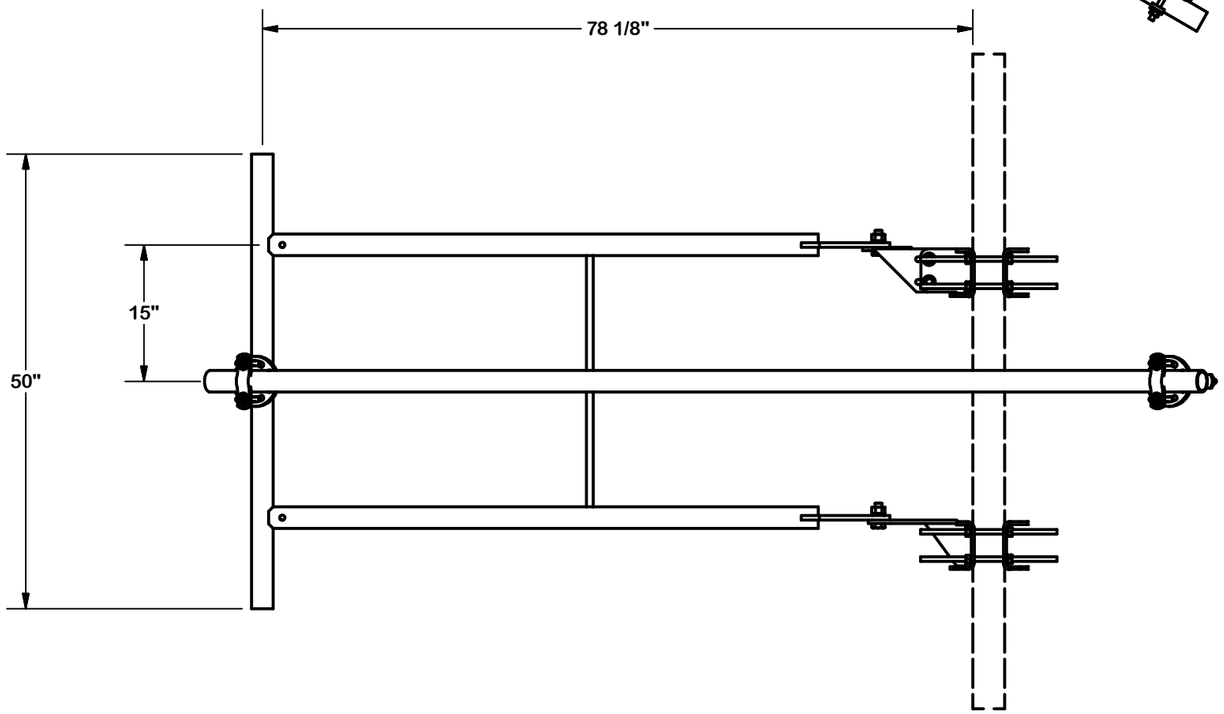
DESCRIPTION: 6' SIDE ARM (PSA6)

SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

| CPD NO. | DRAWN BY | ENG. APPROVAL | PART NO. |
|---|---|---|---|
| 4749 | CEK 9/1/2010 | 2/27/2020 | PSA6 |

| CLASS | SUB | DRAWING USAGE | CHECKED BY | DWG. NO. |
|---|---|---|---|---|
| | | CUSTOMER | BMC 2/27/2020 | PSA6 |




| REV | DESCRIPTION OF REVISIONS | CPD | BY | DATE |
|---|---|---|---|---|
| C | UPDATE LEG CONNECTION | | CSL | 2/26/2020 |
| B | CHNAGED SIDEARM LEG CONNECTION | | CEK | 6/8/2017 |
| A | P1126 CHANGED TO P2126 | 4749 | CEK | 11/13/2015 |

REVISION HISTORY

## TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

PROPRIETARY NOTE:
THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION
6' SIDE ARM
(PSA6)

SITE PRO 1
A valmont COMPANY

Engineering
Support Team:
1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

| CPD NO. | DRAWN BY | ENG. APPROVAL | PART NO. |
|---|---|---|---|
| 4749 | CEK 9/1/2010 | 2/27/2020 | PSA6 |

| CLASS | SUB | DRAWING USAGE | CHECKED BY | DWG. NO. |
|---|---|---|---|---|
| | | CUSTOMER | BMC 2/27/2020 | PSA6 |

SITE PRO 1
A valmont COMPANY

1545 Pidco Drive
Plymouth, IN 46563
Phone: 574.936.4221
Fax: 574.936.8925
Email: SP1Engineering@valmont.com
www.sitepro1.com

June 5, 2020

**Site Pro 1 / Valmont Mounting System:**

Part Number = PSA6
Part Description = 6 Ft Medium Duty Stand-off Arm Mount

**Mount EPA (No antenna pipes ):**

| | | | | | |
|---|---|---|---|---|---|
| $EPA_N$ | = 6.23 sq-Ft | $EPA_{N\ (0.5''\ Ice)}$ | = 8.24 sq-Ft | $EPA_{N\ (1''\ Ice)}$ | = 10.32 sq-Ft |
| $EPA_T$ | = 8.81 sq-Ft | $EPA_{T\ (0.5''\ Ice)}$ | = 11.38 sq-Ft | $EPA_{T(1''\ Ice)}$ | = 14.00 sq-Ft |
| Weight | = 183 lb | $Weight_{(0.5''\ Ice)}$ | = 219 lb | $Weight_{(1''\ Ice)}$ | = 271 lb |

**Classification Rating:**

M600R (450)-1[6]

**Design Standards**

ANSI/TIA-222-G-2012
ANSI/TIA-222-H-2018
ASCE 7-16
International Building Code 2018
TIA-5053

**Analysis and Modeling Technique**

An elastic, three-dimensional, frame, truss model was developed to examine the structural behavior of the mount. All orientations in the engineering model correspond with the assembly drawing constraints. The mount was analyzed with a six (6) inch eccentric offset in the vertical direction. Factored loads (wind, ice, and weight) were applied at the mast pipe. Wind directions considered were perpendicular (normal) to the face of the frame and at 30 degree increments up to 90 degrees (tangential) to the face of the frame.

The Mount was also analyzed for a whip antenna load, attached at two points (15” separation on the vertical face pipe), centered on the centerline of the mount (i.e. no vertical eccentricity). The maximum allowable moment force is 1,580 ft-lbs. The weight of the antenna was considered to be a maximum of 50 lbs. This condition assumes one (1) tie-back attached to the center of the vertical pipe and positioned 45 deg. from the frame. Self-weight of the mount was also considered.

SITE PRO 1
A valmont COMPANY
1545 Pidco Drive
Plymouth, IN 46563
Phone: 574.936.4221
Fax: 574.936.8925
Email: SP1Engineering@valmont.com
www.sitepro1.com

## Modeling Software

Autodesk Inventor
RISA-3D

## Analysis Design Criteria

| | |
|---|---|
| Maximum Mount Height | 400' |
| Maximum Ultimate Wind Speed, no Ice | 180 mph 3 sec gust |
| Maximum Design Wind Speed, no Ice | 140 mph 3 sec gust |
| Maximum Design Wind Speed on Ice | 60 mph 3 sec gust |
| Structure Class | I or II |
| Exposure Category | B or C |
| Topographic Category | I |
| Maximum Design Ice Thickness, $t_i$ | 1" (2.75" factored ice) |
| Wind Direction Probability Factor, $K_d$ | 0.95 |
| Gust Effect Factor, $G_h$ | 1.0 |

## Capacity Results

The following factored loads at each weldment represent the capacity of the mount based on the criteria and modeling technique described above.

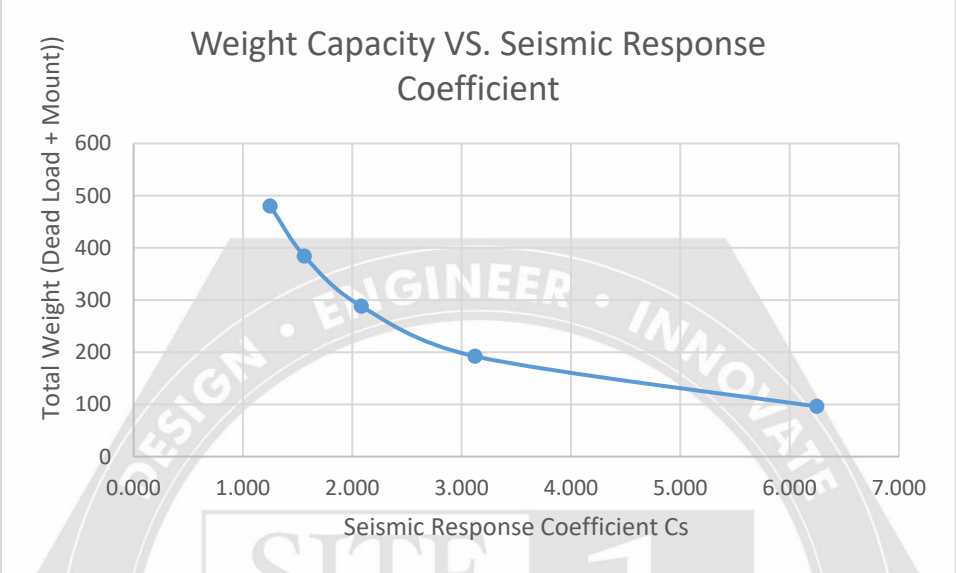
| | | |
|---|---|---|
| Normal Wind Load (no ice), $F_{no}$ | .....600 lb | [375 lb Non-Factored] |
| Tangential Wind Load (no ice), $F_{to}$ | .....600 lb | [375 lb Non-Factored] |
| Vertical (Dead) Load, $F_{zo}$ | .....300 lb | [250 lb Non-Factored] |
| Normal Wind on Ice, $F_{ni}$ | .....113 lb | |
| Tangential Wind on Ice, $F_{ti}$ | .....113 lb | |
| Vertical (Dead + Ice) Load, $F_{zi}$ | .....450 lb | |
| Normal Maintenance Wind Load, $F_{nm}$ | .....60 lb | |
| Tangential Maintenance Wind Load, $F_{tm}$ | .....60 lb | |
| Vertical Dead Load, $F_{zm}$ | .....300 lb | [250 lb Non-Factored] |
| Vertical Live Load, $L_M$* | .....375 lb | [250 lb Non-Factored] |

* In addition to a nominal Live Load of one (1) 250 lb concentrated on the end of mount to provide access for climbers.

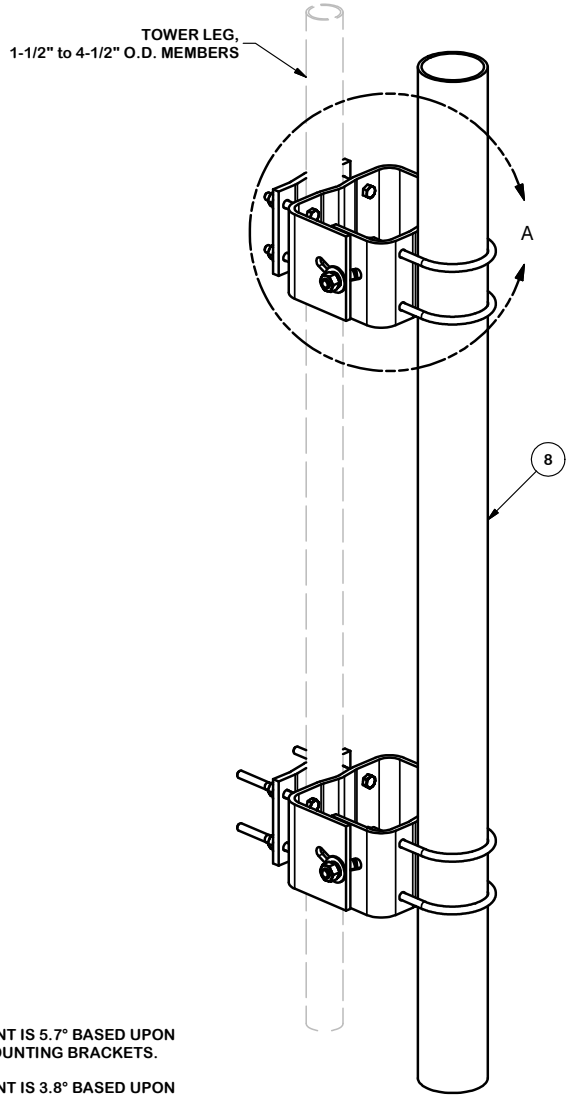
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A valmont COMPANY
1545 Pidco Drive
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Phone: 574.936.4221
Fax: 574.936.8925
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## Seismic Results

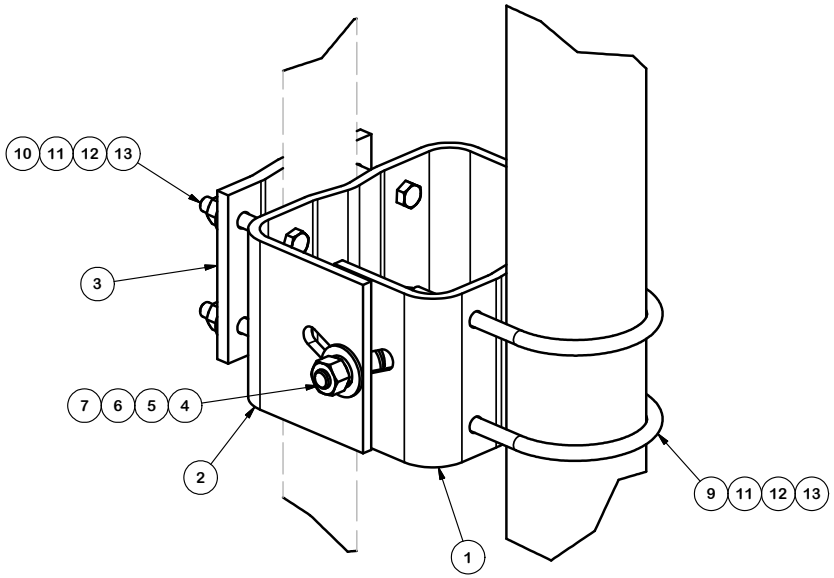
The following Seismic Response Coefficient chart below represent the allowable weight capacity of the bracket based on the criteria and modeling technique described in TIA-222-H Section 2.7.7.1.1. Total allowable seismic shear must be less than or equal to the Capacity Results ($F_{no}$) stated above.




DESIGN • ENGINEER • INNOVATE
SITE PRO 1
A valmont COMPANY
LESS STRESS • LESS STRAIN




| PARTS LIST | | | | | | |
|---|---|---|---|---|---|---|
| ITEM | QTY | PART NO. | PART DESCRIPTION | LENGTH | UNIT WT. | NET WT. |
| 1 | 2 | X-154463 | UNIVERSAL PIPE MOUNTING PLATE (INNER) | 16 11/32 in | 10.52 | 21.03 |
| 2 | 2 | X-155561 | UNIVERSAL PIPE MOUNTING PLATE (OUTER) | 20 9/32 in | 13.16 | 26.31 |
| 3 | 2 | X-159999 | BACKING PLATE | 6 9/16 in | 5.73 | 11.46 |
| 4 | 4 | G5802 | 5/8" x 2" HDG HEX BOLT GR5 | | 0.27 | 1.08 |
| 5 | 8 | G58FW | 5/8" HDG USS FLATWASHER | 1/8 in | 0.07 | 0.56 |
| 6 | 4 | G58LW | 5/8" HDG LOCKWASHER | | 0.03 | 0.10 |
| 7 | 4 | G58NUT | 5/8" HDG HEAVY 2H HEX NUT | | 0.13 | 0.52 |
| 8 | 1 | P472 | 4-1/2" X 72" SCH. 40 GALVANIZED PIPE | 72 in | 64.89 | 64.89 |
| 9 | 4 | X-UB1458 | 1/2" X 4-5/8" X 7" X 3" GALV U-BOLT | | 0.97 | 3.89 |
| 10 | 8 | G1204 | 1/2" x 4" HDG HEX BOLT GR5 FULL THREAD | 4 in | 0.27 | 2.16 |
| 10 | 8 | G12065 | 1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD | 6 1/2 in | 0.41 | 3.28 |
| 11 | 16 | G12FW | 1/2" HDG USS FLATWASHER | 3/32 in | 0.03 | 0.55 |
| 12 | 16 | G12LW | 1/2" HDG LOCKWASHER | 1/8 in | 0.01 | 0.22 |
| 13 | 16 | G12NUT | 1/2" HDG HEAVY 2H HEX NUT | | 0.07 | 1.15 |
| | | | | | TOTAL WT. # | 136.92 |




DETAIL A

**TAPER NOTE:**
THE MAXIMUM TAPER ADJUSTMENT IS 5.7° BASED UPON 30" SPACING OF ADJUSTABLE MOUNTING BRACKETS.

THE MAXIMUM TAPER ADJUSTMENT IS 3.8° BASED UPON 45" SPACING OF ADJUSTABLE MOUNTING BRACKET.

| REVISION HISTORY | | | | |
|---|---|---|---|---|
| REV | DESCRIPTION OF REVISIONS | CPD | BY | DATE |
| A | CHANGED THE AMOUNT OF 5/8" FLATWASHER FROM 4 TO 8 | | MS | 12/18/2015 |

## TOLERANCE NOTES

**TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:**
**SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")***
**DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES**
**LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES**
**BENDS ARE ± 1/2 DEGREE**
**ALL OTHER MACHINING *(± 0.030")***
**ALL OTHER ASSEMBLY *(± 0.060")***

PROPRIETARY NOTE:
THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION
R5 UNIVERSAL PIPE MOUNT KIT
WITH 4-1/2" PIPE

SITE PRO 1
A valmont COMPANY

Engineering Support Team:
1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

| CPD NO. | DRAWN BY | ENG. APPROVAL | PART NO. | PAGE |
|---|---|---|---|---|
| 4718 | RH18 3/29/2010 | | R5 | 1 OF 1 |

| CLASS | SUB | DRAWING USAGE | CHECKED BY | DWG. NO. |
|---|---|---|---|---|
| 81 | 01 | CUSTOMER | BMC 11/12/2015 | R5 |

SITE PRO 1
A valmont COMPANY

1545 Pidco Drive
Plymouth, IN 46563
Phone: 574.936.4221
Fax: 574.936.8925
Email: SP1Engineering@valmont.com
www.sitepro1.com

September 10, 2021

**Site Pro 1 / Valmont Mounting System:**

Part Number = R5
Part Description = Two Bracket, Pipes, and Hardware Mounting Pipe

**Mount EPA (No Antenna pipe, 0 Degree tilt):**

| | | | | | |
|---|---|---|---|---|---|
| $EPA_N$ | = 2.85 sq-Ft | $EPA_{N\ (0.5"\ Ice)}$ | = 3.36 sq-Ft | $EPA_{N\ (1"\ Ice)}$ | = 3.90 sq-Ft |
| $EPA_T$ | = 3.15 sq-Ft | $EPA_{T\ (0.5"\ Ice)}$ | = 3.69 sq-Ft | $EPA_{T\ (1"\ Ice)}$ | = 4.26 sq-Ft |
| Weight = 137 lb | | $Weight_{(0.5"\ Ice)}$ | =167 lb | $Weight_{(1"\ Ice)}$ | = 206 lb |

**Classification Rating:**

None

**Design Standards**

ANSI/TIA-222-G-2012
ANSI/TIA-222-H-2018
ASCE 7-16
International Building Code 2018
TIA-5053

**Analysis and Modeling Technique**

An elastic, three-dimensional, frame, truss model was developed to examine the structural behavior of the mount. All orientations in the engineering model correspond with the assembly drawing constraints. The mount was analyzed with one (1) mounting locations (antenna, mount pipe, radio, and any other appurtenance) evenly spaced across the face of the mount, with no (0) vertical eccentricity and no moment arm. Mounting brackets analyzed with a forty-two (42) inch separation. Wind directions considered were perpendicular (normal) to the face of the frame and at 30 degree increments up to 90 degrees (tangential) to the face of the frame. Wind, dead weight and ice weight on the mount was also included in the model. See FEA report for details.

**Modeling Software**

Autodesk Inventor
ANSYS Workbench

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A valmont COMPANY
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Fax: 574.936.8925
Email: SP1Engineering@valmont.com
www.sitepro1.com

## Analysis Design Criteria

| | |
|---|---|
| Maximum Mount Height | 400' |
| Maximum Ultimate Wind Speed, no Ice | 180 mph 3 sec gust |
| Maximum Design Wind Speed, no Ice | 140 mph 3 sec gust |
| Maximum Design Wind Speed on Ice | 60 mph 3 sec gust |
| Structure Class | I or II |
| Exposure Category | B or C |
| Topographic Category | I |
| Maximum Design Ice Thickness, $t_i$ | 1" (2.75" factored ice) |
| Wind Direction Probability Factor, $K_d$ | 0.95 |
| Gust Effect Factor, $G_h$ | 1.0 |

## Capacity Results

**Scenario 1: (Fixed Connection) (rotation about the tower leg prohibited)**

The following factored loads at each mounting location represent the capacity of the mount based on the criteria and modeling technique described above. Note: capacity is based on a pair (2) of brackets.

| | | |
|---|---|---|
| Normal Wind Load (no ice), $F_{no}$ | .....7500 lb | [4688 lb Non-Factored] |
| Tangential Wind Load (no ice), $F_{to}$ | .....3750 lb | [2344 lb Non-Factored] |
| Vertical (Dead) Load, $F_{zo}$ | .....3750 lb | [3125 lb Non-Factored] |
| Normal Wind on Ice, $F_{ni}$ | .....1250 lb | |
| Tangential Wind on Ice, $F_{ti}$ | .....1250 lb | |
| Vertical (Dead + Ice) Load, $F_{zi}$ | .....5000 lb | |
| Normal Maintenance Wind Load, $F_{nm}$ | .....750 lb | |
| Tangential Maintenance Wind Load, $F_{tm}$ | .....750 lb | |
| Vertical Dead Load, $F_{zm}$ | .....3750 lb | [3125 lb Non-Factored] |
| Vertical Live Load, $L_M$* | .....750 lb | [500 lb Non-Factored] |

* In addition to a nominal Live Load of two (2) 250 lb concentrated on either side of a mounting location to provide access for climbers.

SITE PRO 1
A valmont COMPANY
1545 Pidco Drive
Plymouth, IN 46563
Phone: 574.936.4221
Fax: 574.936.8925
Email: SP1Engineering@valmont.com
www.sitepro1.com

**Scenario 2: (Pinned Connection) (rotation about the tower leg limited by frictional capacity only)**

The following factored loads at each mounting location represent the capacity of the mount based on the criteria and modeling technique described above. Note: capacity is based on a pair (2) of brackets.

| | | |
|---|---|---|
| Normal Wind Load (no ice), $F_{no}$ | .....7500 lb | [4688 lb Non-Factored] |
| Tangential Wind Load (no ice), $F_{to}$ | .....1900 lb | [1188 lb Non-Factored] |
| Vertical (Dead) Load, $F_{zo}$ | .....3750 lb | [3125 lb Non-Factored] |
| Normal Wind on Ice, $F_{ni}$ | .....1250 lb | |
| Tangential Wind on Ice, $F_{ti}$ | .....1250 lb | |
| Vertical (Dead + Ice) Load, $F_{zi}$ | .....5000 lb | |
| Normal Maintenance Wind Load, $F_{nm}$ | .....750 lb | |
| Tangential Maintenance Wind Load, $F_{tm}$ | .....750 lb | |
| Vertical Dead Load, $F_{zm}$ | .....3750 lb | [3125 lb Non-Factored] |
| Vertical Live Load, $L_M$* | .....750 lb | [500 lb Non-Factored] |

* In addition to a nominal Live Load of two (2) 250 lb concentrated on either side of a mounting location to provide access for climbers.

## Seismic Results

The following Seismic Response Coefficient chart below represent the allowable weight capacity of the bracket based on the criteria and modeling technique described in TIA-222-H Section 2.7.7.1.1. Total allowable seismic shear must be less than or equal to the Capacity Results (**$F_{no}$**) stated above.

